

**REMARKS**

Applicant respectfully requests reconsideration of the present application in view of the above amendments and the following remarks.

Claim 50 has been canceled without prejudice. Claims 32, 34-36, 39, 40, 44, 48, 49 and 51 and have been amended; new Claim 53 has been added. Claims 32-49 and 51-53 are being presented for prosecution on their merits.

**I. SUBSTANCE OF INTERVIEW**

Applicant's representatives, Mr. Lance Gustafson and the undersigned attorney, met with Examiner David Parsley on May 16, 2006, to discuss claims presented in the prior Reply and Amendment. Applicant's representatives stated their opinion that the primary reference, U.S. Patent No. 4,716,676 to Imagawa, does not disclose the structural features found in the three independent claims currently pending in this application. In addition, some of the advantages of Applicant's invention (including avoiding having to re-dry the products that have been heat treated) were discussed.

No agreement was reached regarding the allowability of the independent claims; it was agreed that Applicant needed to file an Amendment After Final in order for the Examiner to conduct a supplemental search and/or consider the issues raised in the draft claims.

The undersigned attorney wishes to thank Examiner Parsley for his time and courtesy extended in the interview on May 16, 2006.

## **II. SUMMARY OF FINAL OFFICE ACTION**

The Examiner rejected Claims 32-34, 26-40, 42-44, 49, 51 and 52 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 4,716,676 to Imagawa.

The Examiner rejected Claims 35 and 50 under 35 U.S.C. § 103(a) as being unpatentable over Imagawa in view of U.S. Patent No. 6,141,901 to Johnson et al.

The Examiner rejected Claims 41 and 45-47 under 35 U.S.C. § 103(a) as being unpatentable over Imagawa and further in view of U.S. Patent No. 5,965,185 to Bianco or U.S. Patent No. 6,227,002 to Bianco et al.

The Examiner rejected claim 48 under 35 U.S.C. § 103(a) over Imagawa in view of U.S. Patent No. 3,814,315 to Dmysh.

## **III. SUMMARY OF APPLICANT'S INVENTION**

Generally speaking, Applicant's invention is a portable/moveable apparatus for eradicating pests through the use of heated air. Applicant's apparatus comprises a chamber having a ceiling and a floor, a door that allows ingress to and egress from the interior of the chamber, a forced-air heater for directly heating the air before it enters the chamber, and at least one plenum for assisting in circulating the air in the interior of the chamber and for improving the distribution of the heated air in order to heat the interior of the chamber more evenly.

In a related embodiment, Applicant's apparatus includes a control means for regulating the heating and air circulating means.

**IV. SUMMARY OF THE PUBLICATIONS CITED IN THE OFFICE ACTION**

**A. U.S. Patent No. 4,716,676 to Imagawa**

Imagawa discloses a system for destroying insects which comprises a circulation chamber (A) that directs steam through a series of vertical self-contained units that enclose harvest boxes filled with fruit. The self-contained units are called "insect killing cells" (B). The circulation chamber utilizes a plurality of blowers 10 that move the steam in a horizontal direction. Each insect killing cell is a separate unit which includes a hood having a differential blower mounted on the hood to draw steam from the floor, through the fruit boxes and out the top of the hood (i.e., moves steam in a vertical direction). A heating device 13 and a cooling device 14 communicate with the circulation chamber (A) via a pair of discharge ports 15. A steam generator 12 also discharges directly into the chamber.

**B. U.S. Patent No. 6,141,901 to Johnson et al.**

Johnson et al. discloses a method of controlling pests by heating an area to a lethal temperature and maintaining the lethal temperature for at least eleven hours. The treatment is commenced after determining air penetration parameters for the treatment zone. The temperature in the treatment zone is elevated at a rate of between 5° F and 10° F per hour until the air temperature reaches the lethal level.

**C. U.S. Patent No. 5,965,185 to Bianco**

Bianco discloses a transportable and size-adjustable apparatus for accelerating the ripening process of produce. The apparatus includes an air-flow control system for transferring air between a high pressure plenum and a low pressure plenum.

**D. U.S. Patent No. 6,227,002 to Bianco et al.**

Bianco et al. discloses an apparatus for cooling produce. The apparatus includes a container and a cooler. The cooler is movable between a first position where the cooler is disposed within the interior volume and a second position where the cooler is at least partially retracted from the interior volume.

**E. U.S. Patent No. 3,814,315 to Dmysh**

Dmysh discloses an apparatus for heating the interior of cargo trailers. The apparatus is secured to the external surface of the trailer via a curved housing.

**V. RESPONSE TO REJECTIONS AND OBJECTIONS**

**A. The Anticipatory Rejection (35 U.S.C. §102)**

A rejection under 35 U.S.C. §102(b) requires that each and every element of the claimed invention be taught by the cited reference. Since a patent must describe and enable an invention to one skilled in the art, an anticipatory patent by definition must place the claimed invention into the public domain.

Imagawa discloses an apparatus that produces steam and floods an interior chamber with that steam to kill insects on or in fruit. A heating system that heats water and produces steam as the medium for conducting the heat uses a boiler.

In contrast, Applicant's independent claims 32 and 49 have been amended to expressly include a forced-air heater, and independent claim 44 has been amended to expressly include a forced-air furnace; forced-air heaters and furnaces are designed to directly heat the air to a temperature that is lethal to pests. Applicant uses the forced-air heater to heat the air inside the chamber, and not a boiler to produce steam as disclosed in Imagawa.

The Examiner states in the final Office Action that Imagawa is capable of heating air. Applicant submits that in order to heat air, Imagawa would require some type of heat exchanger that transfers heat from the steam to air. Applicant's forced-air heaters directly heat the air as recited in the currently amended independent claims.

One skilled in the art would readily recognize the differences between a technology that utilizes a forced-air heater and a technology that utilizes a boiler to produce steam. "A *warm-air heating system* is one in which the air is heated in a furnace and circulated through the rest of the structure either by gravity or motor-driven centrifugal fans. If the former is the case, then the system is commonly referred to as a *gravity warm-air heating system*. Any system in which air circulation depends *primarily* on mechanical means for its motive force is called a *forced warm-air heating system*." (See p. 125, Chapter 6, Warm-Air Heating Systems, *Audel*<sup>TM</sup> HVAC Fundamentals Volume I – Heating Systems, Furnaces, and Boilers, 4<sup>th</sup> Edition, James E. Brumbaugh, ©2004 by Wiley Publishing, Inc., Indianapolis, IN, emphasis in the original).

*Audel* continually stresses the differences between a heating system that heats air directly and one that uses a boiler to heat water until it produces steam.

*Audel* continues by stating:

The American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE) defines a furnace as a complete heating unit for transferring heat from fuel being burned to the air supplied to a heating system.” The *Standard Handbook for Mechanical Engineers* (Baumeister and Marks, seventh edition) provides a definition that differs only slightly from the one offered by ASHRAE: “a self-enclosed, fuel-burning unit for heating air by transfer of combustion through metal directly to the air.” Contained within these closely similar definitions are the two basic operating principles of a furnace: (1) Some sort of fuel is used to produce combustion, and (2) the heat resulting from this combustion is transferred to the air within the structure. Note that *air* – not steam, water, or some other fluid – is used as the heat conveying medium. This feature distinguishes warm-air heating systems from the other types; see Chapter 6, “Warm-Air Heating Systems.”

(Page 273, *Audel*™ *HVAC Fundamentals Volume I – Heating Systems, Furnaces, and Boilers*, 4<sup>th</sup> Edition, James E. Brumbaugh, ©2004 by Wiley Publishing, Inc., Indianapolis, IN.)

Applicant has amended the claims to expressly include the terms “forced-air heater” or “forced-air furnace.” Support for the term “forced-air” can be found in Applicant’s specification *inter alia* at paragraph 0058, and Figures 10A and 10B.

*Audel*<sup>TM</sup> sets forth the following definitions:

**Air**

Air is a gas consisting of a mechanical mixture of 23.2% oxygen (by weight), 75.5% nitrogen, 1.3% argon with small amounts of other gases. It functions as the heat-conveying medium for warm-air heating systems... (See *Audel* at pg. 16.)

**Steam**

Steam is a colorless, expansive, and invisible gas resulting from the vaporization of water. The white cloud associated with steam is a fog of minute liquid particles formed by condensation. (See *Audel* at pgs. 18-21.)

Although the Examiner has expressly stated in the various Office Actions his opinion that “air” and “steam” are identical, Applicant respectfully submits that authors of *Audel*, HVAC mechanics, mechanical engineers, physicists, and chemists would disagree with the Examiner’s opinion.

A system utilizing warm air as a medium for carrying the heat does not have to take into consideration the effects of vaporization, boiling points of liquids, condensation and other factors

commonly associated with a heating system that utilizes steam. In fact, a heating system that produces warm air is completely different in structure and operation than a heating system that produces steam. This not only includes the method of producing the medium (furnace for warm air vs. boiler for steam) but how that medium is delivered to the desired location.

Applicant submits that:

- A) Imagawa discloses the use of steam to kill pests. In contrast, Applicant's independent claims 32, 44 and 49 have been amended to include the limitation that the Applicant's apparatus destroys pests through the use of heated air.
- B) Imagawa requires a boiler to produce steam. A boiler is designed to heat water to at least the boiling point of water (212° F) in order to produce steam. Applicant utilizes a forced-air heater as claimed in claims 32 and 49, or a forced-air furnace as claimed in claim 44, that directly heats air; Applicant does not claim a boiler. (Applicant's heater does not need to produce heat at 212° F, nor is it designed to boil water.)
- C) Imagawa floods its outer chamber with steam and then redirects the steam through a plurality of hoods 21 and blowers 10, 11. Applicant utilizes a plenum to control the introduction of the heated air into the chamber. As supported by the Helmes Declaration and the *Audel* publication (See Chapter 6), a plenum is used to direct heated air, not steam.

The Applicant's two basic premises: 1) a heating system that produces steam is so different structurally and operationally from a heating system that heats air *directly* such as a

forced-air heater or a forced-air furnace that no steam system can anticipate an invention based on a forced-air heater or a furnace; and 2) a plenum is designed to channel air not steam; are well-known in the art.

Applicant submits that one skilled in the art, after reading Applicant's specification (including Figures 2B, 5A, 5B, 10A and 10B), would immediately discern that Applicant is utilizing a "forced-air heater" or "furnace" as defined by either ASHRAE or the *Standard Handbook for Mechanical Engineers*. Applicant's heating means heats the air directly as is understood by those in the industry, and when interpreting the common HVAC terms forced-air heater, direct-fired heater and furnace. Applicant's system does not heat water, steam or any other liquid as is disclosed in Imagawa and Applicant's claimed invention does not require a heat exchanger.

Since Imagawa only discloses an apparatus that produces and delivers steam to kill insects, it cannot disclose each and every element of Applicant's invention that claims the use of a forced-air heater to directly heat air then circulates the heated air to kill pests. Imagawa cannot disclose each and every element of Applicant's claimed invention and, specifically, Imagawa cannot anticipate Applicant's independent claims 32, 44 and 49, or any claim that depends directly or indirectly from the independent claims (33-43, 45-48, and 51-53). Applicant traverses the Examiner's rejection and respectfully requests that the rejection based on §102 be withdrawn.

With respect to claim 33, Applicant claims a second plenum. As set forth in *Audel* and the earlier-filed Declaration signed by Jeff Helmes, a heating system that uses steam as a medium for delivering heat does not utilize a plenum. Not only does Imagawa fail to disclose one plenum, it fails to disclose two plenums.

**B. The Obviousness Rejections (35 U.S.C. §103)**

Under MPEP 2143.03 all claim limitations must be taught or suggested by the prior art to establish a case of prima facie obviousness. MPEP 2143.03 further states that if an independent claim is nonobvious under 35 U.S.C. §103, then any claim depending therefrom is nonobvious.

Imagawa does not teach or suggest the use of warm air to kill insects. Since *Audel* expressly lays out the differences between the components used in a steam heating system and the components used in a warm-air heating system, Imagawa cannot make obvious Applicant's claimed invention.

Moreover, Imagawa and the other references cited by the Examiner do not suggest the structural features disclosed in Applicant's independent claims 32, 44 and/or, and 49. As such, none of the references cited by the Examiner, either alone or in combination, can make obvious Applicant's independent claims, or any claim that depends directly or indirectly from the independent claims (including claims 33-43, 45-48, and 51-53.)

Applicant has claim limitations in claims 32, 44 and 49 that the forced-air heater must *directly* produce heated air. The Examiner states that Johnson et al. discloses a direct-fired system. Johnson's heater heats air and outputs heated air. Imagawa discloses a pest eradicating system that uses a boiler to make steam in order to produce an environment necessary to kill insects. The Examiner cites Imagawa as the primary reference. Applicant submits that a system that uses steam requires a boiler, and a direct-fired heater cannot replace a boiler since it is not designed to produce steam.

The Examiner states in the Office Action that it would have been obvious to one of ordinary skill in the art to take Imagawa and add the direct-fired heating unit of Johnson et al. As indicated in Mr. Helmes Declaration which is supported by *Audel*<sup>TM</sup>, the production and

delievery of steam requires specially adapted equipment. Replacing Imagawa's boiler with Johnson's heater would render Imagawa inoperable. Therefore, the Examiner's combination of Imagawa with Johnson is defective on its face.

The combination of Imagawa with Johnson et al. would render Imagawa unsatisfactory for its intended purpose, so there can be no motivation or suggestion to make the proposed combination. Therefore, the Examiner's combination of Imagawa with Johnson et al. is defective on its face and must be withdrawn. (See MPEP §2143.01.)

Applicant has added new Claim 53 which expressly sets forth the temperature and time period for ensuring that all pests are terminated. In Applicant's background section, the International Plant Protection Convention (IPPC) is mentioned regarding the treatment it recognizes for destroying pests in wood. Enclosed is a copy of the relevant portions from the IPPC's *Guidelines for Regulating Wood Packaging Material in International Trade* stating that, for heat treatment, wood packaging material should be heated to achieve a wood core temperature of 56 degrees Celsius for a minimum of thirty minutes.

An important advantage of Applicant's invention is that by directly heating air and moving that air into the chamber, the products being treated with heat are not saturated in water at the conclusion of the heat-treatment. Imagawa floods its chamber with steam, thereby ensuring that all objects within the chamber will be coated with water when the interior of the chamber returns to "room temperature."

Applicant's invention is primarily intended to treat wood and wood products including wood packaging and pallets. These wood products are dried (preferably in a kiln) before being assembled. Otherwise, after assembly, the individual wood pieces would dry at different rates increasing the probability that the wood pieces would separate. Also, Applicant discloses in

paragraph 0047 that its claimed invention can treat machinery, food products, and other staples. By subjecting these products to steam as taught by Imagawa would have a negative effect on the products (machinery will rust, food products would be destroyed or become moldy).

Imagawa is specifically designed to heat-treat fruit. The fruit is not harmed by being subjected to the steam, nor are they degraded when the fruit returns to room temperature and the steam converts to water vapor. Treating wood products, machinery and food products in a system taught by Imagawa, would be futile since the steam would destroy or adversely effect the products being heat-treated. Therefore, Imagawa not only fails to teach or suggest Applicant's structural elements, it fails to attain the advantages of using Applicant's invention.

## **VI. CONCLUSION**

Applicant has amended independent claims 32, 44 and 49 to expressly recite a forced-air heater that directly heats the air that is circulated within the chamber. Applicant believes that it has traversed all of the rejections raised by the Examiner in the outstanding Final Office Action.

The differences between the prior art as a whole and the presently claimed invention are substantial. Imagawa is fundamentally different in how it destroys insects since it utilizes steam heating system. In contrast, Applicant uses a forced-air heater to directly heat air that is circulated within a chamber to kill pests. Further, Imagawa neither discloses nor suggests a chamber having the features claimed by Applicant. For example, Imagawa does not disclose or suggest a plenum or a forced-air heater as claimed by Applicant. In addition, because of its reliance on steam to kill pests, Imagawa cannot attain the advantages of Applicant's system (e.g., heat-treating a wide variety of products). Since Imagawa does not disclose or suggest an apparatus that uses heated air, or an apparatus that has a plenum, Applicant requests that the

Reply to final Office Action dated March 7, 2006

Examiner withdraw all art rejections based on Imagawa.

Applicant further submits that Imagawa does not disclose or suggest a plenum as is commonly defined in the art.

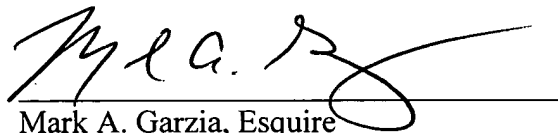
In view of the above, Applicant submits that this Reply places the application in condition for allowance. Applicant respectfully requests reconsideration of the present application in view of the above amendments and remarks, and the early issuance of a Notice of Allowance for Claims 32-49 and 51-53.

Since Applicant is responding to a Final Office Action, Applicant respectfully requests that, if this Reply does not place the pending claims in condition for allowance, the Examiner enter this Amendment so that the claims are in better form for appeal.

Respectfully submitted,

Daniel P. Topp

Date: 7 JUNE 2006

  
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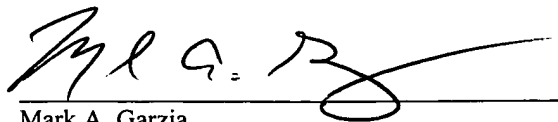
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**CERTIFICATE OF MAILING**

I hereby certify that this Reply Pursuant to 37 CFR §1.111, along with any paper or fee indicated as being enclosed, is being deposited with the United States Postal Service as First Class Mail, postage prepaid, and addressed to the Mail Stop AF, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on June 7, 2006.

Date: 7 JUNE 2006

  
Mark A. Garzia